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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,087	02/23/2004	Ralph Kurt	081468-0308336	3511
909	7590	04/04/2005	EXAMINER	
PILLSBURY WINTHROP, LLP			BERMAN, JACK I	
P.O. BOX 10500			ART UNIT	
MCLEAN, VA 22102			PAPER NUMBER	
			2881	

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

EX

Office Action Summary	Application No. 10/783,087	Applicant(s) KURT ET AL.	
	Examiner Jack I. Berman	Art Unit 2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/23/2004</u> . | 6) <input type="checkbox"/> Other: ____. |

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5, 7-9, 11-14, 18, 21, 24-27, 29, and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Mori et al. (European Patent Application 0 874 283 A2). Mori et al. discloses a measuring device for measuring at least one property of contamination of a surface of a component (projection lens 21) in a lithographic projection apparatus, the measuring device comprising: a radiation transmitter (10) for transmitting radiation onto at least a part of said surface; a radiation receiver (detector 24) for receiving radiation from the component in response to the transmitted radiation; and a processor (light detection system 26) communicatively connected to the radiation receiver, for deriving at least one property of received radiation (intensity) and determining at least one property (amount) of said contamination from said at least one property of received radiation. In the embodiment described at line 53 in column 13 through line 49 in column 14, Mori et al. teaches to provide a second radiation receiver (detector 44b) for receiving at least a part of the transmitted radiation, and to configure the processor (control system 27) to compare said part of the transmitted radiation with the radiation received from the component, determine from the received radiation a relative property (intensity) relative to said part of the transmitted radiation, and determine from the relative property at least one

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property (the amount or thickness) of said contamination. At lines 28-31 in column 9, Mori et al. teaches to compare at least one property (the intensity) of received radiation with at least one reference value (a threshold illumination intensity value) related to the at least one contamination property. At lines 19-25 in column 9, Mori et al. teaches to configure the processor (light detection system 26) to determine a first property of the received radiation (the intensity at one time), determine a second property of the received radiation (the intensity at a second time), and derive from said first property of the received radiation and the second property of the received radiation at least one contamination property (the amount) of said contamination. At lines 12-15 in column 2, Mori et al. teaches that one of the contaminants detected by the disclosed system is organic compounds, i.e. carbon containing materials. At lines 16-20 in column 5, Mori et al. teaches that the contamination detection system disclosed is suitable for Deep Ultraviolet Radiation lithography systems. The light source used in the Mori et al. system apparently transmits radiation at a substantially constant intensity because at lines 4-10 in column 10, Mori et al. discloses an embodiment addressing how to correct for the special case wherein fluctuations in detected radiation intensity are caused by fluctuations in the intensity of the light generated by the source rather than by contamination on the optical components. Mori et al. also discloses the method of using this device.

Claims 1, 3-9, 13-19, 21, 22, 24, 25, 27, 29, and 30 are rejected under 35 U.S.C. 102(e) as being anticipated by Kondo. Kondo discloses a measuring device for measuring at least one property of contamination of a surface of a component (mirror 23 and filter 25) in a lithographic projection apparatus, the measuring device comprising: a radiation transmitter (light source system 1) for transmitting radiation onto at least a part of said surface; a radiation receiver

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(micro-channel plates 34*a* and 34*b*) for receiving radiation from the component in response to the transmitted radiation; and a processor (4) communicatively connected to the radiation receiver, for deriving first and second properties of received radiation (photoelectron or Auger electron intensity and energy) and determining first and second properties of said contamination (thickness and chemical composition) from said at least one property of received radiation (see embodiment 4 from line 51 in column 15 through line 24 in column 16). At lines 40-42 in column 17, Kondo teaches that the contamination that modulates the transmitted radiation contains carbon and oxide containing materials. At lines 57-58 in column 17, Kondo teaches that ultraviolet light or an electron beam can be used as the transmitted radiation. In Representative Embodiment 5, from line 26 in column 16 through line 30 in column 17, Kondo teaches to provide a second radiation transmitter (light sources 301*a* and 301*b*) for generating radiation at the surface of interest, wherein said generated radiation differs in wavelength or radiation type from the transmitted radiation, and a second radiation receiver (electron-energy analyzers 7*a* and 7*b*) for receiving the generated radiation. While in the preferred embodiments Kondo uses a pulsed radiation source having an intensity that varies in time, lines 64-67 in column 17 teach that a constant intensity radiation transmitter can be used instead. At lines 4-11 in column 18, Kondo teaches to configure a receiver to receive radiation from at least two different parts of the surface and to configure the processor to determine a property of contamination for each of said different parts. Kondo also discloses the method of using this device.

Claims 1, 3, 4, 7-10, 13, 14, 21, 24, 26, and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Hamm. In paragraphs [0021] and [0022] Hamm discloses a measuring device for measuring at least one property of carbon containing contamination of a surface of an

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optical component in an Extreme Ultraviolet lithographic projection apparatus, the measuring device comprising: a radiation transmitter for transmitting radiation onto at least a part of said surface; a radiation receiver for receiving radiation reflected from the component in response to the transmitted radiation; and a processor communicatively connected to the radiation receiver, for deriving at least one property of received radiation (intensity and/or polarization) and determining at least one property (density) of said contamination from said at least one property of received radiation. In paragraphs [0012] and [0013], Hamm teaches to use this device to measure contamination during cleaning of the surface.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamm in view of Sommargren. While Hamm is silent as to whether the intensity of the radiation transmitted by the transmitter and used to measure the reflectivity of the optical elements in the

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lithography system is constant or varies in time, Sommargren teaches that the ability of a system using reflected light to detect contamination on a surface can be enhanced by using a heterodyne device with a radiation transmitter that transmits radiation having an intensity that varies in time. It would have been obvious to a person having ordinary skill in the art to apply the teachings of Sommargren to the Hamm device by using Sommargren's heterodyne device as the reflectivity measuring device taught by Hamm in order to take advantage of the enhanced sensitivity taught by Sommargren.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo. Since Kondo teaches, at lines 4-11 in column 18, to configure a receiver to receive radiation from at least two different parts of the surface and to configure the processor to determine a property of contamination for each of said different parts, it would have been obvious to a person having ordinary skill in the art to configure the device with a scanning radiation transmitter for consecutively transmitting the radiation onto each of these different parts.

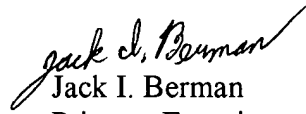
Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Mori et al., Kondo, or Hamm. It would have been obvious to a person having ordinary skill in the art to provide a computer program product to perform the method disclosed in each of these references. Such computer program products to control the operation of devices are common practice in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack I. Berman whose telephone number is (571) 272-2468. The examiner can normally be reached on M-F (8:30-6:00) with every second Friday off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jack I. Berman
Primary Examiner
Art Unit 2881

jb
3/31/05